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ABSTRACT

Institutional and individual determinants of adult participation in higher education are examined. By means of an ordinary least squares regression, the 1970 degree-credit college enrollment of a sample of 57,689 married men and women 25 or older living in metropolitan areas was predicted. Being a Vietnam veteran tripled the likelihood of a male's attending college. Establishing a new two-year college where none had existed before or lowering the tuition from $400 to zero doubled the college attendance rate of local adults. None of the characteristics of local four-year public colleges was found to have a significant effect on adult college attendance. (Author)

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John Bishop and Jane Van Dyk

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Can Adults be Hooked on College? Some Determinants of Adult College Attendance

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December 1975

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ABSTRACT

This study examines institutional and individual determinants of adult participation in higher education. By means of an ordinary least squares regression, we predicted the 1970 degree-credit college enrollment of a sample of 57,689 married men and women 25 or older living in metropolitan areas. Being a Vietnam veteran tripled the likelihood of a male's attending college. Establishing a new two-year college where none had existed before or lowering the tuition from $400 to zero doubled the college attendance rate of local adults. None of the characteristics of local four-year public colleges was found to have a significant effect on adult college attendance.

CAN ADULTS BE HOOKED ON COLLEGE? SOME DETERMINANTS OF ADULT COLLEGE ATTENDANCE

Adult education is a major element in the nation's overall educational effort. In October 1972, adult students (those aged 25 and over) constituted 20 percent of undergraduate degree-credit enrollment [14, p. 20]. Many other adults are enrolled in noncredit courses or graduate degree programs, making the total number of adult students much larger. According to the May 1972 Current Population survey, over 12 million adults, 7 million of whom were over age 35, engaged in part-time study of some kind at some time during the 1971-1972 academic year [7, 11]. Of the 12 million, 4.39 million took at least one course at a four-year college. Total opening fall enrollment--for degree and nondegree credit--at these institutions was 8.95 million. Moreover, whereas degree-credit enrollment of students aged 18-24 (the so-called traditional students) remained approximately constant between 1970 and 1973, degree-credit enrollment of adults aged 25-34 grew by 35 percent [13, p. 2]. Hence adults comprise a large and growing segment of higher education's clientele.

The rising participation of adults in higher education has been attributed to a number of factors: increased numbers of conveniently located colleges offering courses tailored to meet the special needs of adults, the need to learn new skills as old ones become obsolescent due to technological progress, and the increasing desire of men and women to obtain training that will make possible professional advancement. The last few years in particular have witnessed an increasing emphasis on making higher education more accessible to

people throughout their entire life span (the "lifelong learning" or "continuing education" or "open education" movement). Generally, philosophical reasons have been given for supporting this movement, which is intended to meet the needs of a pluralistic population as it moves toward becoming a learning society [1, p. 122]. Recently the American Council on Education Committee on Higher Adult Education and the Commission on Non-Traditional Study have strongly endorsed continuing education and have recommended a number of ways to implement it [10, 5].

The heightened interest in adult students is also a pragmatic response to the hope that in the 1980s nontraditional students will fill the classrooms that are emptied by the contraction of the 18-24 age cohort. Whereas the 18-24 age group comprised over 80 percent of higher education's enrollment in 1970, this proportion is projected to drop to roughly 78 percent by 1980 and 74 percent by 1990, even without an increased emphasis on adult education [1, p. 122]. The Carnegie Commission in its final report expresses the hope that the addition of "nontraditional" students will fill the gap [4]. The conclusion is inescapable:

> Higher education will no longer be a growth industry unless an entirely new constituency can be attracted to its institutions, and unless continuing education becomes an accepted pattern in our society [9, p. 6].

Will adult participation in higher education continue to grow? One way to pose this question is to ask whether the nation as a whole can achieve the rates of adult college attendance that currently

prevail in California. In 1970, the rate of degree-credit enrollment of males aged 30-34 with 12 or 13 years of schooling living in urban areas was .087 in California and .037 in the nation. The corresponding attendance rates for women were .050 and .022. Contrasts between metropolitan areas were even larger: The college attendance rate of males aged 30-34 with 12 or 13 years of schooling was .101 in Orange County, California, but only .009 in Wilkes Barre, Pennsylvania. What makes California's adult attendance rates so much higher? Is it the zero tuition, the open-door admissions policy, or the large number of conveniently located two-year colleges? Or are Californians unique in some other way? The relative importance of these factors is unknown.

Very little is known about the effectiveness of public policies designed to stimulate adult college attendance. What proportion of the veterans now attending college would not have enrolled without financial aid provided by the GI Bill? What is the effect of the presence or absence of a two-year college on adult enrollment in a given area? Will the presence of a four-year college have the same impact? Does the location of a college affect the attendance rate? How important are individual characteristics, such as age, sex, income, occupation, or number of children, in determining adult enrollment? As Freeman and Holloman observed in a recent article, "Our knowledge of enrollment decisions of older people is currently limited" [6, p. 27].

Clearly, extensive and up-to-date information about the determinants of adult college attendance is needed. The purpose of this study was to provide some of this information. The determinants upon which we focused are those under public control: tuition, location, the GI Bill, and admissions policies (selectivity) of public two-year and

four-year colleges. In addition, we examined the effect of individual characteristics on enrollment. Section I describes the data and methodology. Section II presents the results. Implications for projections of future enrollments and for the debate over the appropriate level of tuition are discussed in section III.

I. Data and Methodology

The population studied comprises the bulk of the pool of potential adult students: the 46 million people aged 25 and over who have a high school degree but have less than two years of college. Our sample was drawn from the 1970 Census and consisted of one-third of one percent of the people with 12 or 13 years of schooling who were married and living with spouse and lived in one of the 89 largest northern and western Standard Metropolitan Statistical Areas (SMSAs). Southern metropolitan areas, except those in Texas, were excluded from the sample.[1] Smaller metropolitan areas and nonmetropolitan areas were also excluded because they were not separately identified on the County Group Public Use Census Tapes that were available. Persons for whom it was not possible to identify state of residence were also excluded. This sampling procedure yielded 57,689 people.

The objective of low tuition at public colleges is not to shuffle students from one institution or SMSA to another, but to increase the total number of participants in higher education. We attempted to measure the impact of college availability on aggregate attendance, not on the choice of where to attend. Married adults ordinarily have responsibilities--jobs and families--that prevent them from moving

to a different area because of the price and quality of the available colleges or universities. Thus limiting our sample to married people aged 25 and older allows us to interpret our results as changes in aggregate college attendance. Our methodology would be inappropriate for predicting graduate school attendance of adults or college attendance of persons aged 18-24, for in these cases migration decisions are often made at the same time as college-attendance decisions.

To determine if an individual was attending college, the census asked "Since February 1, 1970, has this person attended regular school or college at any time? Count...schooling which leads to... [a] college degree." Note that reported enrollment was either part time or full time and in a specific two-month period during the second semester. By specifically referring to work towards a degree, the question eliminated students in terminal vocational technical programs. The only additional information available from the census data on the character of the school attended was whether it was publicly or privately controlled.

We worked with data on individuals.[2] The dependent variable was given a value of one if the individual was attending college, zero if not. Both attendance at any college and attendance at a public college were predicted, enabling us to judge the impact of low-cost two-year colleges on the distribution of adult students between the private and public institutions. Using ordinary least squares on the individual data, we regressed college attendance on the person's own characteristics and on variables defining the college availability environment of the SMSA of residence.

Data on the characteristics of public two-year and four-year colleges in the SMSAs sampled were obtained from standard reference sources [3, 8, 11]. The dimensions for which measures were available were (a) tuition, (b) admissions requirements, (c) distance from central business district, and (d) size of the geographic area served by the typical college. Where more than one college served an area and tuition levels or admission policies varied, an unweighted average was used for that SMSA.[3] The distance variable was defined as the number of miles from the central business district to the closest college campus. Size of the area served by the college was calculated as the total number of square miles in the urban area divided by the number of two-year college campuses. Our measures of location within the SMSA--distance to the central business district and size of the service area--were very imperfect indicators of proximity. Consequently, the explanatory power and statistical significance of these location variables is not expected to be high.

In order to compare the responsiveness of men and women, the sample was divided into (1) husbands living with spouse and (2) wives living with spouse. The individual characteristics that were held constant were race, Spanish American background, Jewish extraction, veteran status, marital status, number of children, presence of children under six, occupation, age, and age squared. The census tape used provided measures of these characteristics for each member of the sample. By controlling for these personal characteristics, we avoided attributing their effects to instruments of public policy such as tuition or admissions standards.

It is not possible, however, to measure all the determinants of college attendance. A bias will result if an unmeasured determinant is correlated with one of the variables included in the model. If adults with an unmeasured characteristic that increases their likelihood of attending college tend to live in metropolitan areas with high tuitions or without two-year colleges, we will underestimate the impact of such educational policies. On the other hand, if adults with such an unmeasured characteristic tend to live in areas that have two-year colleges with low tuitions, we will overestimate the impact of such policies.

If the political process that sets policy for higher education responds to these unmeasured local taste differences, there is a potential problem of simultaneity. In some localities a strong local taste for higher education may have resulted in the jurisdiction following a relatively restrictive policy.[4] Government officials foresaw that establishing a system of low-tuition, two-year colleges would result in a flood of students and thus force them to ask for unpopular tax increases. Private colleges or four-year public colleges were serving the demand and would suffer from the competition. In other localities an unmeasured taste for higher education may have had the opposite effect, contributing to the early establishment of two-year colleges and keeping their tuition low.

Thus, the results reported in section II carry a caveat. They are unbiased estimates of the true impacts of educational policies only if in our sample of SMSAs public policy was determined exogenously or if the counteracting effects on policy of unmeasured taste factors

on average canceled each other out. This assumption, however, is not unreasonable.[5]

II. Results

At any given time only a small proportion (less than 2 percent) of the adults in the United States with a high school degree or one year of college are taking degree-credit college courses. Because this proportion is so small, we will borrow a reporting technique that is commonly used for health statistics. All attendance rates and changes in attendance rates are reported as the number per 10,000 eligible. The typical SMSA of 100,000 has approximately 20,000 adults eligible for attendance in either the freshman or sophomore year of college. Thus, if the eligibles are equally divided between the sexes and if unmarried adults respond the same way as the married adults in our sample, the numbers reported approximate enrollments and enrollment changes expected in the typical SMSA of 100,000. In Spring 1970 the census reported college attendance rates of 181 per 10,000 eligibles for husbands and 76 per 10,000 eligibles for wives. The college attendance rates of minority group members were higher: 217 per 10,000 for husbands and 123 per 10,000 for wives. A substantial proportion of these married adult students--85 percent of the husbands and 24 percent of the wives--were employed full time outside the home.

A. Institutional Characteristics as Determinants of Attendance

A linear regression was fitted to the data described above by ordinary least squares. For each variable we tested the hypothesis that when the other variables were controlled this variable had no effect on college attendance. A variable is reported below as statistically significant if this hypothesis was rejected at the .05 level.[6] (See Appendix Tables 1 and 2.)

The only characteristics of local colleges that consistently had statistically significant effects on adult attendance were the existence of at least one two-year college within commuting distance and the tuition level of that college. The absence of a two-year college was associated with a substantial reduction in adult college attendance. Our regressions predicted that if a two-year college charging $180 annual tuition were established where none had existed before, husbands' attendance would rise by 95 per 10,000 and wives' attendance would rise by 54 per 10,000 (see Table 1). This occurred despite the fact that all the SMSAs without two-year colleges had public four-year colleges within commuting distance.

Where there was a local two-year college, lowering its annual tuition from $400 to zero doubled the number of husbands and wives attending college. For husbands the number attending rose from 165 to 306 per 10,000; for wives it rose from 66 to 132. As tuition at the two-year college approached zero, the impact of further reductions increased. For husbands, for example, a reduction in tuition from $400 to $300 increased college attendance by 13 per 10,000, whereas a reduction from $100 to zero increased attendance by 58 per 10,000.

Table 1. Expected Degree-Credit Freshman and Sophomore Enrollment of Married Adults over Age 25 Per 10,000 Eligibles by Whether a Local Two-Year College Exists and Its Tuition Level

Two-Year College Policy	Husbands			Wives		
	Expected Enrollment in Public Colleges	Expected Enrollment in Private Colleges	Total Expected Enrollment	Expected Enrolment in Public Colleges	Expected Enrollment in Private Colleges	Total Expected Enrollment
Tuition = 0	272	34	306	125	7	132
Tuition = $180	161	5	212	71	15	86
Tuition = $400	98	67	165	48	18	66
No Local Two-Year College	77	40	117	27	5	32

Note: These are approximately the numbers of adult degree-credit students an SMSA of 100,000 could expect.

These predictions are based on a linear probability model of college attendance in the second semester of the 1969-1970 academic year that was estimated with ordinary least squares. Personal characteristics that were controlled were marital status, sex, number of children, minority status, Jewish background, age, and veteran status. If occupation and family income minus own earnings had been controlled the results would not have changed in any important respect. The regression equations' prediction is evaluated at the mean of all variables except those explicitly changed. The means of junior college characteristics are .46 for open door college, 77 for percent admitted, 3.4 for distance from central business district, and approximately 12 for square root of urban area divided by campuses.

The tuition level of the two-year college also changed the distribution of adult students between public and private institutions. The rate of enrollment in private colleges in SMSAs where public two-year colleges charged no tuition was between one-half and one-third of the rate in SMSAs where two-year colleges charged $400 in tuition. The private sector is very small, however, so the students lost by the private sector were only a small part (15 percent) of the public sector's enrollment gain.

Distance from the central business district and size of area served were never statistically significant. We had hypothesized that a smaller attendance area and a location closer to the central city would increase college attendance. The results obtained did not support these hypotheses.

About half of the people in our sample lived in SMSAs with an open-door local two-year college (defined as an institution that accepted at least 97 percent of all applicants). For wives this factor raised college attendance by a statistically significant 50 per 10,000. It also raised the attendance rate of husbands (by 39 per 10,000), but that effect was not significant at the .05 level.

Despite the fact that almost every SMSA had a local public four-year college or university, none of the characteristics of these colleges (tuition, selectivity, proximity) had a statistically significant impact on aggregate college attendance.

B. Personal Characteristics as Determinants of Attendance

The individual's age and the presence of children in the family had a strong impact on college attendance. The older the individual the less likely he or she was to take degree-credit courses. The presence of children in the family reduced college attendance of both the husband and wife. Apparently the time required for parenting and the pressures of immediate financial responsibilities made it difficult for mothers and fathers to attend college. For wives, the factor with the strongest negative effect was the presence of children under the age of six. For husbands, children of any age had a negative effect.

The family income variable was defined as total family income minus the individual's earnings.[7] For wives, an increase of $5000 in spouse's earnings or unearned income raised the attendance rate 35 per 10,000. For husbands, the effect was larger still: A $5000 increase in spouse's earnings or unearned income raised attendance by 138 per 10,000.

Minority status did not have a consistent effect on attendance. Holding other things constant, black men had attendance rates that were lower than those of non-Spanish white men by a statistically significant 130 per 10,000. Spanish-Americans and black women had insignificantly higher attendance rates than nonminority women. If other factors had remained constant, attendance rates of minority males would have been lower than attendance rates of nonminority males. They turned out to be higher (217 versus 181 per 10,000) because the

minority males in our sample tended to live in metropolitan areas where tuitions were very low (such as California, New York, and Chicago), and this substantially raised their attendance rates.

Almost one-third of the women in our sample had not worked for pay in the last ten years. Holding age and all other factors constant, attendance rates for these women were lower than those of women who had worked by 145 per 10,000. This suggests that job-related aspirations were an important part of women's reasons for returning to college to work for a degree.

Government employees and professional technical workers were substantially more likely to be attending college. This was as expected, for promotion and salary in such occupations are often explicitly conditioned upon academic course work, and employers frequently pay the tuition costs of attending college.[9] The increment to the college attendance rate from being a government employee was 235 per 10,000 for men and 50 per 10,000 for women. Attendance rates of professional/technical workers were higher than those of other white-collar workers by 285 per 10,000 for men and 153 per 10,000 for women. Attendance rates of female teachers were 370 per 10,000 higher than those of other professional women.

The veterans in our sample who had been discharged after 1955 were eligible for GI Bill education benefits. In the fall of 1970 full-time students could receive between $175 and $230 per month, depending on the number of dependents. These subsidies seem to have had a substantial effect, for the attendance rate of Vietnam veterans in our sample was 321 per 10,000 higher than the attendance rate of nonveterans their age. Men currently in the armed forces were much

less likely to be attending college. This is as expected. They were already undergoing on-the-job training, and the free correspondence schools (USAFE) that were available to them do not fit the census definition of school attendance.

III. Implications and Discussion

These results have implications both for projections of future adult enrollments and for policy decisions about the appropriate level of tuition to be charged adults.

A. Implications for Projections of Future Enrollments

Public efforts to encourage college attendance have included establishing colleges in cities that had none before, keeping tuition low, liberalizing admission requirements, and the GI Bill. If these efforts are largely responsible for past growth of adult enrollment, then future growth must inevitably slow, for almost all major cities now have public two-year colleges and tuition charges are not likely to fall in real terms in the future. To the extent that the strong demand for employees with college training that existed during the 1960s was responsible for the increases in adult participation, we must now expect declines, for we are entering a period in which college graduates are in relative surplus. If, however, the enrollment increase was caused by changes in adult tastes for education, the trend might fairly be projected to continue.

Of the public policy efforts, the GI Bill seems to have been the most influential in increasing adult enrollment, at least for men. If veterans had had the attendance rate of nonveterans, our male sample's college attendance rate would have dropped from 181 per 10,000 to 106 per 10,000. Thus if all of the effect of being a veteran is attributable to the GI Bill, the GI Bill is responsible for over 40 percent of all male adult enrollment and 27 percent of combined adult enrollment of both sexes.[9] The number of veterans eligible for GI Bill benefits and the benefit payment levels have been increasing. Until 1966 veterans discharged after 1955 were not eligible for educational benefits. Veterans are more likely to make use of the GI Bill educational benefits if they are available immediately after discharge. The number of discharges, benefit levels, and awareness of the program all have increased since 1966, so the GI Bill has provided a continuing stimulus to the growth of adult enrollment.

The second major contribution of public policy to recent enrollment growth has been the establishment of new two-year colleges. Our regressions predict a doubling of adult enrollment when a two-year college with tuition of $180 is established in an SMSA that formerly had none. In 1955, many major metropolitan areas did not have even one low-tuition community college.[10] California was the only state with free open-door community colleges in every city of appreciable size, and this resulted in California's having 52 percent of the nation's two-year college students. Since 1955, however, the number of public two-year institutions in the United States has risen from 275 to 671,

and nearly every major metropolitan area now has a low-cost public two-year college. California's policies are still more liberal than those of any other state, but its share of two-year college enrollment has dropped to 28 percent as other states have adopted California's pattern.

Our regressions indicate that, if the SMSAs without two-year colleges in 1955 had not established such colleges, our sample's college attendance rate for males would have been 138 per 10,000 instead of 181 per 10,000 and the rate for females would have been 51 per 10,000 instead of 76 per 10,000.[11] Total adult enrollment would have been roughly 30 percent lower.

Thus, public policy seems to have provided a major stimulant to the growth of adult college enrollment. The only aspect of public policy that has tended to depress enrollment is the rise of tuition. In constant 1970 prices, the average of two-year college tuitions rose from $102 in 1956-1957 to $178 in 1969-1970. Our regressions indicate that, if tuition had averaged $102 in 1969-1970, adult enrollment would have been roughly 15 percent higher.

If we were willing to make some strong assumptions and if we knew adult enrollment rates for 1955, it would be possible to decompose the growth of adult enrollment into a policy-induced component and an exogenous-demand component. Unfortunately, the earliest year for which enrollment data on adults over the age of 35 are available is 1968, so no such decomposition is feasible. We do know that degree-credit college attendance rates of males and females aged 30-34 were

two and one-half times higher in 1970 than in 1960. This growth rate is so high that public policy shifts outlined above can be responsible for only a portion of it.[12]

The residual must be attributed to changes in either the economic climate or the cultural climate (tastes). The relative wages of college graduates were improving during the period; however, cross-section work has failed to identify a relationship between adult college attendance and relative wages.[13] The explanation based on cultural climate includes such developments as the women's movement and the lifelong learning movement. It cannot be tested in our data, but by a process of elimination this is the likely explanation of the residual. This explanation is consistent with the fact that female attendance rates were rising faster than male attendance rates (especially when one subtracts out the effect of the GI Bill).

It is impossible to predict whether or not such changes in taste will continue. However, since the explanation based on cultural climate is the only one that is consistent with a continuously increasing adult enrollment rate, many will consider our look into the future an optimistic one. A further source of future growth in enrollment is the upward trend in the number of adults who have started but not completed college. An adult with one year of college is seven times more likely to be enrolled in a degree-credit program than an adult with only a high school degree. Adult enrollment rates will continue to increase, however, only so long as tuitions are kept low. Setting the tuition for adults at a close-to-self-supporting level would cause a precipitous drop in adult enrollment.

B. Implications for Tuition and Financial Aid Policy

Adult students are more responsive to tuition levels than are recent high school graduates. In economics the standard measure of demand responsiveness to the price of a product is its price elasticity--the percentage decrease in enrollment per percentage point of increase in the price. At the mean tuition of $180 per year, tuition elasticity was -.44 for husbands, -.58 for wives. The tuition elasticities calculated for male high school juniors in 1960 ranged from -.39 for recent high school graduates from poverty backgrounds to -.08 for those with high-income parents [2]. While interactions between family income and tuition elasticity were clearly evident for recent high school graduates, such interactions were not discernable for adults.

The high elasticity of demand for adults means that for a given governmental budget, tuition reductions targeted at adults will have a larger impact on college enrollment than tuition reductions targeted at recent high school graduates. If a million dollars were "spent" lowering public college tuition for adults and providing the staff to teach them, the equivalent of 535 new full-time students would be produced.[14] If we assume equal costs of instruction, the same million dollars applied to lowering tuition and hiring staff for recent high school graduates would produce only 227 new students.[15] Most adults attend two-year colleges, and instructional costs per full-time equivalent are generally lower at these institutions ($1437 as opposed to $2526 at four-year colleges in 1969-1970.)

While the foregoing discussion may suggest a rationale for supporting lower tuition charges for adults than for students aged 18-24, there are a number of other important and relevant issues to be examined. Is full-time study more effective per credit hour than part-time study? Are learning and socialization processes more efficient when the individual is young? Are the public benefits of a year of college less for adults than for younger students? The answers to the first two questions are not known. The only thing that can be said with certainty about public benefits of adult education is that such benefits are received over a shorter period of time. Thus if the public benefits of college occur equally in each year of a person's life, the fact that a 40-year-old has fewer years to live lowers the present value of the public benefits he produces to 78 percent of the corresponding present value for a 20-year-old.[16]

Another argument against lowering tuition for adults is as follows: Schooling should be priced according to ability to pay, and adults (especially when studying part-time) have higher incomes and, therefore, can afford to pay more. If being able to afford something means that one will buy it regardless of price, our results demonstrate that the premise of the value judgment is wrong.

On the other hand "afford" may be another way of saying "ability to pay." The practice of awarding financial aid to students may seem to provide a precedent for tuition charges adjusted to one's ability to pay. Student financial aid, however, is presently based primarily on the parents' ability to pay. The social objective served is that of making every youth's opportunity for higher education independent of the socioeconomic level of his or her family.

The current financial aid system, in which subsidies vary with parental income, is consistent with this objective of equality of intergenerational opportunity. An aid system with eligibility based on the current income of the student would be inconsistent with this objective, because anyone could become eligible for aid merely by stopping full-time work to become a student. Thus, arguing that prices charged to different age groups should be based on the average ability to pay of people in the age group is not the application of an old principle but the introduction of a new one.

It is unclear what the results would be if age groups were compared by ability to pay. While adults have higher incomes, they usually have considerably greater financial responsibilities (spouses and children) and typically do not have parents willing and able to help pay for college.

IV. Summary

Colleges and universities facing "steady state" or declining enrollments in the 1970s have looked with increasing interest at the advent of the lifelong learning movement with its emphasis on the adult student. But little is known about what determines the proportion of adults that attend college.

This study examined institutional and individual determinants of adult participation in higher education. A sample of 57,689 individuals living in SMSAs was selected from the 1970 Public Use Census Tapes. The

degree-credit college enrollment of married men and women aged 25 and older was predicted by an ordinary least squares regression. Age, sex, number of children, income, and occupation played important roles in predicting adult attendance. Being a Vietnam veteran tripled the likelihood of a male's attending college.

Our regression equation enabled us to predict the effect of alternative tuition levels on total adult enrollment. Lowering tuition from $400 to zero doubled the local college attendance rate of adults. Establishing a new two-year college in an SMSA without one also doubled adult enrollment. None of the characteristics of local public four-year institutions was found to have a significant effect on adult enrollment.

Between 1955 and 1970 the proportion of our sample living in SMSAs with local two-year colleges rose from .45 to .90. The GI Bill was extended and liberalized. These changes in public policy are responsible for an important part of the past growth of adult enrollment. Enrollment growth due to cultural changes (the lifelong learning movement and the women's movement) may continue. But, except for lowering tuition, there is little public policy can do to further stimulate the growth of adult enrollment. Therefore, past rates of adult enrollment growth are not likely to continue.

Despite the fact that they usually attend part time and have incomes that are large relative to tuition, adults are more responsive than recent high school graduates to the level of tuition. This means that a reduction in tuition for adults would result in more students per dollar of government expenditure than a similar reduction in tuition for students of traditional college age.

Appendix Table 1

The Effect of Two-Year College Policy on the Percentage of Eligibles Attending First Two Years of College: Husbands Over 25

	Attendance at any College		Attendance at Public College	
	Regression coefficient	t	Regression coefficient	t
Tuition at two-year college ($100's)	-.641	-3.67	-.755	-4.87
Tuition squared ($100's)	.077	2.46	.0845	3.04
Distance to central business district (miles)	-.028	-1.34	-.011	-.59
No two-year colleges within 40 miles	-1.422	-1.91	-.283	-.41
Percentage accepted at two-year college	-.0034	-.49	.012	1.84
Two-year college is open-door	.288	1.02	.177	.71
Size of attendance area (square root of area)	.054	1.99	.026	1.09
No local two-year college within SMSA	-1.422	-1.90	-.966	-1.46
Vietnam veteran	2.514	6.21	1.695	4.51
Veteran	.692	3.19	.492	2.55
Negro	-1.305	3.54	-1.196	-3.65
Spanish American	.401	.83	.651	1.51
Child under 6 (0-1)	-.272	-1.04	-.205	-.88
Number children under 18	-.145	-1.93	-.079	-1.18
Professional/technical	2.85	8.39	2.16	7.15
Government worker	2.35	8.77	2.36	9.91
In armed forces	-4.66	-5.99	-3.73	-5.40
On welfare	3.48	4.14	2.76	3.73
$\bar{R}^2$	.038		.033	
Mean of dependent variable	1.811		1.419	

Note: All coefficients are multiplied by 100 so they can be interpreted as changes in the percentage attending. Variables controlled but not shown were age, age squared, Jewish, teacher, blue-collar worker, farmer, self-employed, and not working for pay.

Appendix Table 2

The Effect of Two-Year College Policy on the Percentage of Eligibles Attending First Two Years of College: Wives Over 25

	Attendance at any College		Attendance at Public College	
	Regression	t	Regression	t
Tuition at two-year college ($100's)	-.297	-2.93	-.389	-4.23
Tuition squared ($100's)	.0251	1.41	.0418	2.60
Distance to central business district (miles)	.017	1.43	.012	1.11
No two-year colleges within 40 miles	-.538	-1.18	-.290	-.71
Percentage accepted at two-year college	-.001	-.28	.0013	.35
Two-year college is open-door	.457	2.82	.414	2.81
No two-year college within SMSA	-.423	.67	-.495	-1.25
Number own children ever born	.057	1.16	.047	1.06
Negro	.184	.80	.180	.87
Spanish American	.250	.81	.388	1.40
Children under 6 (0-1)	-.723	-4.62	-.543	-3.84
Number children under 18	.029	.63	.003	.06
Professional/technical	1.535	6.18	1.231	5.48
Government worker	.500	2.73	.504	3.06
Teacher	3.697	5.37	2.46	3.96
On welfare	.370	.77	-.101	.23
Has not worked for pay since 1959	-1.452	5.67	-1.157	4.99
$\bar{R}^2$	.0095		.0083	
Mean of dependent variable	.758		.618	

Note: Variables controlled but not shown were age, age squared, Jewish, size of attendance area, blue-collar worker, farmer, self-employed, and in the armed forces.

Notes

[1]Southern metropolitan areas were excluded because our inability to control for regional differences in educational climate, racial recruitment patterns, and costs of living might confound comparisons between the South and the rest of the country.

[2]There are a number of advantages to a methodology that uses data on individuals rather than SMSA averages. First, the Census Bureau publishes college enrollment tabulations only for people under age 35, so the enrollment of older people can be studied only by using the Public Use Tapes. Personal characteristics such as age, veteran status, marital status, and number of children are important determinants of college attendance. SMSA averages of these variables for people with 12 or 13 years of schooling aged 25-35 are not generally available. Even if SMSA averages of the appropriate individual-characteristic control variables were available, they would tend to be collinear with the measures of college availability; the independent effects of each would be difficult to disentangle. The disadvantage of using ordinary least squares on individual data is the heteroskedasticity of the error term. While this does not bias our coefficients, it does exaggerate their statistical reliability to some extent.

[3]In 82 SMSAs the values of these variables assigned each person who lived in the SMSA were the same throughout the SMSA. In a few of the very large SMSAs--Baltimore, Boston, Chicago, New York, Philadelphia, Pittsburg, St. Louis, and Washington--separate measures of availability were defined for the central city and for the suburban ring.

[4]New York City provides an illustration. On a priori grounds one would expect New York City with its heavily Jewish population to have a stronger taste for higher education than any other city in the nation. Yet it was not until 1959 that the first two-year college with degree-credit programs was established. New York City also lagged behind much of the rest of the nation in adopting open admissions, and the city's suburbs have not adopted it yet. One would expect the taste for higher education to be stronger in the suburbs. Some suburbs (for example, those of New York and Chicago) have substantially higher tuitions and more restrictive admissions policies than the central city, while others have lower (for example, those of Detroit and Washington, D.C.).

[5]Exogeneity of public policy is a standard assumption in studies of the demand for higher education. Evidence in favor of this assumption is provided by the fact that, when SMSA-specific attendance rates of persons aged 25-34 were predicted, adding measures of the educational climate to the regression equation did not appreciably change the coefficients on tuition or on the dummy variable for existence of a local two-year college. The measures of educational climate (real per-pupil expenditure at the K-12 level and the proportion of household heads with a high school degree or more) were statistically insignificant, and per-pupil expenditure had the wrong (negative) sign. Simultaneous equation methods are not available because (a) each individual is an observation and the simultaneity is at the SMSA or state level, (b) two of the potentially simultaneous variables are zero-one dummies, and (c) three variables are potentially simultaneous so the three exogenous predictors of them would be needed and three such exogenous variables do not exist.

[6]A two-tailed t-test with a critical value of 1.96 was used to test each hypothesis. When a hypothesis referred to the combined effect of two or more variables, as with tuition and tuition squared, the test was conducted by performing an F-test on the increment in R^2 when these two variables were added to the model.

[7]Our measure of family income was defined to exclude the individual's own earnings in order to avoid a feedback or simultaneity bias in our estimates. Attending school takes time, and often this time must come at the expense of time spent working. Thus, deciding to attend school will often cause a reduction in one's earnings. Causation runs both ways, so entering own earnings would contaminate estimates of the effects of other variables. The family income variable includes spouse's earnings and unearned income--interest, rent, dividends, pensions, Social Security, and public assistance. Because it has an income effect only, we expected it to have a positive impact on the probability of college attendance. It is also possible that a husband's withdrawal from the labor market in order to attend college may induce the wife to increase her hours of work. Here again husband's attendance and wife's earnings are simultaneously cause and effect. Because of this danger, all other results reported in this paper are from a regression that did not include a family income variable as a control variable.

[8]In addition, the fact that an individual with only 12 or 13 years of schooling entered a professional technical occupation may reflect a pre-existing aspiration to start or complete college work. If the aspiration was not already there, it may have been induced by contact with college graduates on the job.

[9]It is unlikely that the difference between veterans and non-veterans is wholly attributable to past and present GI bills. One can think of other reasons why veterans might be more likely to attend college: They might have had their schooling plans involuntarily interrupted by army service, or they might have entered the armed forces partly because of the educational benefits they would become eligible for upon discharge. The armed forces reject men who score below a certain level on the AFQT. Therefore, relative to the rest of our sample, veterans may have high academic aptitude.

[10]For example, in 1955 the following cities did not have a local public two-year college that offered degree-credit course work: New York, Louisville, Memphis, Miami, Jacksonville, Atlanta, St. Louis, New Orleans, Cleveland, Cincinnati, Toledo, Philadelphia, Pittsburgh, Newark, Buffalo, Albany, Milwaukee, Hartford, Wilmington, and Portland. The residents of Washington, D.C., and Detroit faced high tuitions and restrictive admissions policies if they chose to attend the two-year institutions located in and controlled by suburban jurisdictions.

[11]Forty-five percent of our sample lived in SMSAs that had established their two-year college system after 1055. Some of the large SMSAs that fall into this category are New York, Philadelphia, Pittsburgh, Newark, Cincinnati, Cleveland, Minneapolis, St. Louis, Dallas, Houston, and Portland. There were two junior colleges in the New York SMSA in 1955, but they offered only terminal vocational programs. Our estimate of the effect of establishing new two-year colleges assumes that tuitions at the new two-year colleges averaged $180

and that the full enrollment impact of new two-year colleges is achieved within a few years. In fact, there seems to be a long lag before the full enrollment impact occurs, so our estimate overstates the size of the short-term response.

[12]Further evidence for the proposition that public policy shifts are only part of the story comes from the fact that between 1960 and 1970 enrollment rates of persons aged 25-34 were rising almost as fast in California as in the nation as a whole despite the fact that California's community college policies remained unchanged.

[13]In other work done by Bishop, variables designed to measure the local labor market's economic payoff to completing college were tried out as independent variables. They never were statistically significant and often had the wrong sign. This is by no means conclusive evidence, but it suggests that the improvements in the relative wages of college graduates that occurred in the 1950s and 1960s are not contributors to the rising rates of adult college attendance. Further evidence in support of unresponsiveness to relative wage rates is the continuing adult enrollment boom in the face of the bust of the labor market for college graduates.

[14] When tuition is lowered by one dollar, the increase in total public subsidy=(the change in public college enrollment)·(instructional cost-tuition) + (the number already enrolled)·(one dollar). Dividing this cost figure by the change in total enrollment produces an estimate of the marginal subsidy cost of the equivalent of one more adult full-time student. For husbands we calculate: [(.004686)($1400-180) + (1.6073)($1)] ÷ .0038272 = $1914. This calculation assumes that adult tuition is lowered at both four-year and two-year colleges.

[15]In the period around 1960, the marginal subsidy cost of an extra freshman obtained by a general reduction in tuition was $1595 plus the cost of instruction [2]. This estimate is low because it does not account for shifts between the public and private sectors, which tend to increase the marginal subsidy cost. Prices, incomes, and attendance all have risen since then, increasing the marginal subsidy cost even more. A conservative estimate of the current marginal subsidy cost of freshmen and sophomores of the traditional age would be $4400 ($3000 plus the cost of instruction).

[16]It is discounted benefits that are comparable with initial costs, and the discounted sum of benefits does not vary significantly for variations in age below age 40. For instance, at a 5 percent real interest rate the present value of $1 received in every year of one's life is 16.7 at age 20, 15.6 at age 30, 13.1 at age 40, and 11.6 at age 50.

References

1. Berendzen, Richard. "Population Changes and Higher Education." Education Record, Spring 1974.
2. Bishop, John. "Income, Ability, and the Demand for Higher Education." Institute for Research on Poverty Discussion Paper No. 293-75. Madison: University of Wisconsin, 1975.
3. Burckel, Christian E. The College Blue Book. 12th and 13th eds. Los Angeles: College Planning Programs, Ltd., 1968 and 1971.
4. Carnegie Commission. Priorities for Action. New York: McGraw-Hill, 1973.
5. Commission on Nontraditional Study. Diversity by Design. San Francisco: Jossey-Bass, 1973.
6. Freeman, Richard, and Holloman, J. Herbert. "The Declining Value of College Going." Change, September 1975.
7. Gilford, Dorothy M. "Statistical Snapshot of Adult Continuing Education." Journal of Higher Education 46 (July 4, 1975).
8. Gleazer, Edmund. American Junior Colleges. 6th ed. Washington, D.C.: American Council on Education, 1971.
9. Glenny, Lyman A. "Pressures on Higher Education." College and University Journal, September 1973.
10. "Higher Education and the Adult Student." ACE Special Report 25. Washington, D.C.: American Council on Education, October 1972.
11. National Center for Educational Statistics, USOE. Participation in Adult Education, 1972. Washington, D.C.: Government Printing Office, forthcoming.

12. W. Todd Furniss. American Universities and Colleges. 11th ed. Washington, D.C.: American Council on Education, 1973.

13. U.S. Bureau of the Census. "Undergraduate Enrollment in 2-Year and 4-Year Colleges: October 1972." Current Population Reports, Series P20, No. 257. Washington, D.C.: Government Printing Office, November 1973.

14. U.S. Bureau of the Census. "Social and Economic Characteristics of Students: October 1973." Current Population Reports, Series P20, No. 272. Washington, D.C.: Government Printing Office, November 1973.

15. University of Wisconsin, Student-Faculty Task Force on the Financing of Higher Education. How Much and How Should the Public Subsidize Higher Education? Report to the Sloan Foundation, June 1974.